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**United States Patent** [19]

**Weiss et al.**

[11] **Patent Number:** **5,851,832**

[45] **Date of Patent:** **Dec. 22, 1998**

[54] **IN VITRO GROWTH AND PROLIFERATION OF MULTIPOTENT NEURAL STEM CELLS AND THEIR PROGENY**

[75] Inventors: **Samuel Weiss; Brent Reynolds**, both of Alberta, Canada; **Joseph P. Hammang; E. Edward Baetge**, both of Barrington, R.I.

[73] Assignee: **Neurospheres, Ltd.**, Canada

[21] Appl. No.: **486,648**

[22] Filed: **Jun. 7, 1995**

**Related U.S. Application Data**

[63] Continuation-in-part of Ser. No. 270,412, Jul. 5, 1994, abandoned, which is a continuation of Ser. No. 726,812, Jul. 8, 1991, abandoned, and a continuation-in-part of Ser. No. 385,404, Feb. 7, 1995, abandoned, which is a continuation of Ser. No. 961,813, Oct. 16, 1992, abandoned, which is a continuation-in-part of Ser. No. 726,812, and Ser. No. **359,945**, Dec. 20, 1994, abandoned, which is a continuation of Ser. No. 221,655, Apr. 1, 1994, abandoned, which is a continuation of Ser. No. 967,622, Oct. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 726,812, Jul. 8, 1991, abandoned, and Ser. No. 376,062, Jan. 20, 1995, abandoned, which is a continuation of Ser. No. 10,829, Jan. 29, 1993, abandoned, which is a continuation-in-part of Ser. No. 726,812, and Ser. No. 149,508, Nov. 9, 1993, abandoned, which is a continuation-in-part of Ser. No. 726,812, and Ser. No. 311,099, Sep. 23, 1994, abandoned, which is a continuation-in-part of Ser. No. 726,812, and Ser. No. 338,730, Nov. 14, 1994, abandoned, which is a continuation-in-part of Ser. No. 726,812.

[51] Int. Cl.<sup>6</sup> ..... **C12N 5/06; C12N 5/08; C12N 5/02**

[52] U.S. Cl. .... **435/368; 435/325; 435/366; 435/383; 435/384**

[58] Field of Search ..... **435/240.2, 325, 435/366, 368, 377, 383, 384**

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*Primary Examiner*—George C. Elliott

*Assistant Examiner*—Johnny F. Railey, II

*Attorney, Agent, or Firm*—Flehr Hobbach Test Albritton & Herbert LLP

[57]

**ABSTRACT**

A method for the in vitro proliferation and differentiation of neural stem cells and stem cell progeny comprising the steps of (a) isolating the cells from a mammal, (b) exposing the cells to a culture medium containing a growth factor, (c) inducing the cells to proliferate, and (d) inducing the cells to differentiate is provided.

**80 Claims, 3 Drawing Sheets**